

THE GENERIC POSITION OF THE AUSTRALIAN LIGHT-BROWN APPLE MOTH  
(LEPIDOPTERA: TORTRICIDAE).

By I. F. B. COMMON, Division of Entomology, C.S.I.R.O., Canberra, A.C.T.

(Sixteen Text-figures.)

[Read 28th June, 1961.]

*Synopsis.*

The Light-brown Apple Moth *Teras postvittana* Walker, usually known in the literature as *Tortrix postvittana*, is here assigned to *Epiphyas* Turner, of which *Austrotortrix* Bradley is a synonym. The genitalia of the type species *E. eucyrta* Turn. and three species known to be of economic importance, *E. postvittana* (Walk.), *E. xyloides* (Meyr.) and *E. liadelpa* (Meyr.), are figured. Altogether 32 Australian species are now referred to *Epiphyas* and their synonymy is given.

INTRODUCTION.

The important Australian tortricid pest, the Light-brown Apple Moth *Teras postvittana* Walker, has for long been referred to the genus *Tortrix* Linnaeus. Recent systematic studies of the Tortricidae have shown that the structure of the genitalia is of the greatest value in differentiating genera and most of the species. On the basis of these characters, the genus *Tortrix* must be restricted to the single European type species *Phalaena Tortrix viridana* L., while some 200 species included by Meyrick (1913) in this genus must be assigned elsewhere.

Having concluded that *T. postvittana* and certain related species could not be referred to *Tortrix*, or any of the genera formerly placed in its synonymy, Bradley (1956) based a new genus *Austrotortrix* on this species and added nine species from Australia and New Zealand. Differences in venation, shown here not to be of generic significance, no doubt caused Bradley (1956) to overlook the genus *Epiphyas* Turner when describing his new genus. The present paper assigns *postvittana* and 31 related species to *Epiphyas*, redefines the genus and states the synonymy of the species included. In addition to *E. postvittana*, the two species *E. xyloides* (Meyr.) and *E. liadelpa* (Meyr.) are known to attack plants of economic importance.

Genus *EPIPHYAS* Turner.

*Epiphyas* Turner, 1927, *Pap. roy. Soc. Tasm.* (1926): 125. *Austrotortrix* Bradley, 1956, *Bull. ent. Res.*, 47: 101. (Type species *Teras postvittana* Walk., 1863, by original designation.) (New synonymy.)

Type species *Epiphyas eucyrta* Turner, 1927, by original designation.

Antenna in male finely serrate and ciliated; labial palpus about twice diameter of eye, second segment curved slightly upwards, expanded above with appressed scales, apical segment smooth-scaled, porrect. Thorax without posterior crest. Forewing smooth,  $R_1$  from one-half cell,  $R_2$  from three-quarters,  $R_4$  from upper angle to costa,  $R_5$  separate to termen,  $M_2$ ,  $M_3$  and  $Cu_1$  more or less equidistant at base,  $M_3$  and  $Cu_1$  often strongly curved and nearly parallel,  $M_3$  absent in some specimens. Hindwing with  $R_s$  and  $M_1$  closely approximated at base, connate or short-stalked,  $M_2$  approximated at base to  $M_3$  or  $Cu_1$ ,  $M_3$  connate or stalked with  $Cu_1$  from lower angle of cell, or  $M_3$  absent. Abdomen in male with well differentiated mensis ventralis, clothed with long scales, on eighth sternum.

Male genitalia (Text-figs 1-2): Uncus long, strongly spatulate, with slender base or with parallel sides, apex rounded, truncate or slightly concave; socii small; gnathos arms long, slender, curved, united medially to form a slight hook; transtilla absent; valva broadly rounded with a differentiated distal lobe or cucullus, often large, sacculus



Text-figs 1-8.—Ventral view of male genitalia, and lateral view of aedeagus, of *Epiphyas*: 1, 2, *E. eucyrta* Turn., holotype; 3, 4, *E. postvittana* (Walk.); 5, 6, *E. liadelpa* (Meyr.); 7, 8, *E. xyloides* (Meyr.).

Text-figs 9-16.—Ventral view of female genitalia, and enlarged signum, of *Epiphyas*: 9, 10, *E. postvittana* (Walk.), holotype; 11, 16, *E. xyloides* (Meyr.), holotype of *Tortrix paraplesia* Turn.; 12, 14, *E. eucyrta* Turn., allotype; 13, 15, *E. liadelpa* (Meyr.).

well developed, smooth, sclerotized, extending from base of valva to end of valvula, costa strongly arched, valvula membranous with a longitudinal and an oblique fold, and clothed with long scales; basal processes of valvae broad at base, slender apically, straight above with small irregular marginal spines, apices joined medially by membranous band. Aedoeagus pistol-shaped, without external ornamentation, or with a single short thick projection above orifice; cornuti two to four, flattened, elliptical, deciduous but with basal point of articulation of each clearly visible when cornuti shed.

Female genitalia (Text-figs 13, 15): Ostium a membranous shallow cup, sterigma moderately sclerotized, colliculum a sclerotized plate, longitudinally curved, the free ventral edges rounded and sometimes overlapping; ductus bursae constricted at colliculum, gradually broadening to junction of corpus bursae, cestum absent; corpus bursae rounded, signum a sclerotized plate, blade-like, hook-like or in the form of a short tapering dagger, often with capitulum.

Turner (1927) considered that *Epiphyas* was derived from *Tortrix*, from which it differed only in the stalking or coincidence of  $M_3$  and  $Cu_1$  of the hindwing. In the type species, these two veins were coincident, although in one specimen which Turner believed to be conspecific these two veins were stalked. In a second species *chlidana* Turn., which he also referred to *Epiphyas*, Turner stated that  $M_3$  and  $Cu_1$  of the hindwing were stalked.

An examination of the type series of *E. eucyrta* and *E. chlidana* has revealed an extraordinary confusion. The latter species clearly does not belong to the Tortricidae at all, but to the Olethreutidae, the genitalia being quite characteristic of that family, while there is also a well developed cubital pecten of the hindwing, apparently overlooked by Turner.

Two of Turner's type series of *E. eucyrta*, including the holotype, came from Rosebery, Tasmania, and three from Strahan, Tasmania. The genitalia in both sexes are so closely similar to those of *Tortrix leuropa* Turner (1939) from Scottsdale, Tasmania, in which both  $M_3$  and  $Cu_1$  of the hindwing are present, that there seems little doubt that the two are conspecific. In general facies also these two species are almost identical. In other specimens from Victoria, with genitalia and facies similar to *E. eucyrta*, these two veins are either stalked or connate. It must be concluded, therefore, that the loss or stalking of  $M_3$  in the hindwing is not of generic significance in this group of the Archipinae.

Although Turner stated that all the veins of the forewing were present in *Epiphyas*, he apparently overlooked the fact that  $M_3$  is absent in both forewings of the type series of *E. eucyrta*. However, once again the specimens of *Tortrix leuropa* have all the veins present in the forewing, while in the series from Victoria  $M_3$  is either present or absent. The loss of  $M_3$  in the forewing therefore is likewise not of generic significance in the group.

The genitalia of both sexes of *E. eucyrta* are quite typical of many Australian species, including *postvittana*, formerly referred to *Tortrix* and more recently to *Austrotortrix*. The genus *Epiphyas* Turner is therefore sustained, not on the grounds proposed by Turner, but chiefly on the genitalic characters. Thus the name of the Light-brown Apple Moth becomes *Epiphyas postvittana* (Walker).

*Epiphyas* is one of the more specialized genera of the subfamily Archipinae, a group which has reached a remarkable degree of development in Australia and New Zealand (Common, 1958). Of special importance in separating it from related genera is the form of the colliculum, ostium and sterigma in the female and the form of the valva, with its basal processes, and of the aedoeagus in the male. The colliculum is short, almost cylindrical, with approximated or overlapping rounded ventral edges. In *Adoxophyes* Meyrick this structure is similar or is reduced to two small sclerotized plates. In *Isotenes* Meyrick it is also small and often similar to *Epiphyas*. The cestum, a ribbon-like thickening of the ductus bursae, common in many related genera of the Archipinae, is entirely lacking in *Epiphyas*. In the male, the large rounded membranous valva, with longitudinal and oblique folds, and usually with a large membranous

cucullus, is characteristic. In some species, however, the cucullus is quite small. The sclerotized sacculus is smooth, without the terminal spine-like projection present in *Homona* Walker and such Holarctic genera as *Archips* Hübner. The aedoeagus is usually without any external projections.

To the genus *Epiphyas* should be referred the following Australian species. The author has examined the genitalia of the holotypes or lectotypes of all the species and their synonyms, with the exception of *T. cerussata* Meyr. and *T. eugramma* Low. The genitalia of specimens from the original series or from the type locality of these two species have been studied. With the exception of *E. eucyrta*, each of the following assignments is a new combination.

EPIPHYAS POSTVITTANA (Walk.) (Text-figs 3, 4, 9, 10). *Teras postvittana* Walk., 1863, *List Lep. Ins. Brit. Mus.*, 28: 297 (Type locality: Sydney, N.S.W.; holotype ♀ Brit. Mus., genitalia slide No. BM1815). *Dichelia vicariana* Walk., 1869, *Characters undescr. Lep. Het.*, p. 82 (Holotype ♂ "Dichelia vicariana, Det. by Walker, Type 372", without locality data, without abdomen, Nat. Mus. Vict.). *Tortrix stipularis* Meyr., 1910, *Proc. Linn. Soc. N.S.W.*, 35: 226 (Type locality: Murtoa, V.; holotype ♂ No. 837, Nat. Mus. Vict.) (New synonymy). *Tortrix oenopa* Meyr., 1910, *Proc. Linn. Soc. N.S.W.*, 35: 230 (Type locality: Gisborne, V.; holotype ♂ Nat. Mus. Vict.) (New synonymy). *Tortrix phaeosticha* Turn., 1939, *Pap. roy. Soc. Tasm.* (1938): 76 (Type locality: Strahan, Tas.; holotype ♂ C.S.I.R.O., genitalia slide No. T289) (New synonymy). The holotypes of the other synonyms listed by Bradley (1956) have also been examined, but the references are omitted here for brevity.

EPIPHYAS DOTATANA (Walk.). *Teras dotatana* Walk., 1863, *List Lep. Ins. Brit. Mus.*, 28: 298 (Type locality: Tasmania; holotype ♀ Brit. Mus., genitalia slide No. BM1814). *Tortrix tanyptera* Meyr., 1910, *Proc. Linn. Soc. N.S.W.*, 35: 228 (Lectotype ♀ "Gisborne, 30.3.97", hereby designated, Nat. Mus. Vict.) (New synonymy).

EPIPHYAS CETRATA (Meyr.). *Tortrix cetrata* Meyr., 1910, *Proc. Linn. Soc. N.S.W.*, 35: 230 (Type locality: Deloraine, Tas.; holotype ♂ Brit. Mus., genitalia slide No. BM3398).

EPIPHYAS XYLODES (Meyr.) (Text-figs 7, 8, 11, 16). *Tortrix xyloides* Meyr., 1910, *Proc. Linn. Soc. N.S.W.*, 35: 224 (Type locality: Mt. Victoria, N.S.W.; lectotype ♂ Brit. Mus., designated by Bradley (1956), genitalia slide No. BM2000). *Tortrix eurystropha* Turner, 1926, *Trans. roy. Soc. S. Aust.*, 50: 135 (Type locality: Lamington National Park, Q.; holotype ♂ C.S.I.R.O., genitalia slide No. T249) (New synonymy). *Tortrix paraplesia* Turner, 1914, *Proc. Linn. Soc. N.S.W.*, 39: 553 (Type locality: Ebor, N.S.W.; holotype ♀ C.S.I.R.O., genitalia slide No. T303) (New synonymy).

EPIPHYAS LYCODES (Meyr.). *Tortrix lycodes* Meyr., 1910, *Proc. Linn. Soc. N.S.W.*, 35: 232 (Type locality: Mt. Wellington, Tas.; holotype ♂ Brit. Mus., genitalia slide No. BM1811).

EPIPHYAS HEMIPHOENA (Turn.). *Tortrix hemiphoena* Turn., 1927, *Pap. roy. Soc. Tasm.* (1926): 126 (Type locality: Russell Falls, Tas.; holotype ♂ C.S.I.R.O., genitalia slide No. T288).

EPIPHYAS LYPRA (Turn.). *Tortrix lypra* Turn., 1945, *Trans. roy. Soc. S. Aust.*, 69: 65 (Type locality: Margaret River, W.A., holotype ♂ C.S.I.R.O., genitalia slide No. T344).

EPIPHYAS SOBRINA (Turn.). *Tortrix sobrina* Turn., 1945, *Trans. roy. Soc. S. Aust.*, 69: 62 (Type locality: Brisbane, Q., holotype ♂ C.S.I.R.O., genitalia slide No. T258).

EPIPHYAS EUCYRTA Turn., 1927 (Text-figs 1, 2, 12, 14). *Pap. roy. Soc. Tasm.* (1926): 125 (Type locality: Rosebery, Tas.; holotype ♂ C.S.I.R.O., genitalia slide No. T762). *Tortrix leuropha* Turn., 1939, *Pap. roy. Soc. Tasm.* (1938): 79 (Type locality: Scottsdale, Tas., holotype ♀ C.S.I.R.O., genitalia slide No. T760) (New synonymy).

EPIPHYAS LIADELPHA (Meyr.) (Text-figs 5, 6, 13, 15). *Tortrix liadelpa* Meyr., 1910, *Proc. Linn. Soc. N.S.W.*, 35: 227 (Type locality: Albany, W.A.; lectotype ♂ Brit. Mus., designated by Bradley (1956), genitalia slide No. BM1810).

EPIPHYAS FABRICATA (Meyr.). *Tortrix fabricata* Meyr., 1910, Proc. LINN. Soc. N.S.W., 35: 233 (Type locality: Lorne, V.; lectotype ♂ Brit. Mus., designated by Bradley (1956), genitalia slide No. BM2424).

EPIPHYAS CARYOTIS (Meyr.). *Tortrix caryotis* Meyr., 1910, Proc. LINN. Soc. N.S.W., 35: 227 (Lectotype ♂ "Mt. St. Bernard, Victoria, 5000', G.L., 2.08", selected by J. D. Bradley and hereby designated, Brit. Mus., genitalia slide No. BM1954).

EPIPHYAS SCLEROPA (Meyr.). *Tortrix scleropa* Meyr., 1910, Proc. LINN. Soc. N.S.W., 35: 236 (Lectotype ♂ "Mt. St. Bernard, Victoria, 5000', G.L., 2.08", selected by J. D. Bradley and hereby designated, Brit. Mus., genitalia slide No. BM1975).

EPIPHYAS BALIOPTERA (Turn.). *Tortrix balioptera* Turn., 1916, *Trans. roy. Soc. S. Aust.*, 40: 513 (Type locality: Brisbane, Q., holotype ♂ C.S.I.R.O., genitalia slide No. T246).

EPIPHYAS ERSIBODES (Turn.). *Tortrix ersibodes* Turn., 1916, *Trans. roy. Soc. S. Aust.*, 40: 512 (Type locality: Mt. Kosciusko, N.S.W.; holotype ♂ C.S.I.R.O., genitalia slide No. T947).

EPIPHYAS HAEMATEPHORA (Turn.). *Tortrix haematephora* Turn., 1916, *Trans. roy. Soc. S. Aust.*, 40: 511 (Type locality: Mt. Kosciusko, N.S.W.; holotype ♂ C.S.I.R.O., genitalia slide No. T325).

EPIPHYAS HAEMATODES (Turn.). *Tortrix haematodes* Turn., 1916, *Trans. roy. Soc. S. Aust.*, 40: 513 (Type locality: Mt. Kosciusko, N.S.W.; holotype ♂ C.S.I.R.O., genitalia slide No. T672).

EPIPHYAS ORESIGONA (Turn.). *Tortrix oresigona* Turn., 1939, *Pap. roy. Soc. Tasm.* (1938): 77 (Type locality: Mt. Wellington, Tas.; holotype ♂ C.S.I.R.O., genitalia slide No. T336).

EPIPHYAS EPICHORDA (Meyr.). *Tortrix epichorda* Meyr., 1910, Proc. LINN. Soc. N.S.W., 35: 249 (Lectotype ♂ "Melbourne, Victoria, /92", selected by J. D. Bradley and hereby designated, Brit. Mus., genitalia slide No. BM1812).

EPIPHYAS PLASTICA (Meyr.). *Tortrix plastica* Meyr., 1910, Proc. LINN. Soc. N.S.W., 35: 234 (Type locality: Mt. Wellington, Tas.; holotype ♂ Brit. Mus., genitalia slide No. BM2300).

EPIPHYAS AULACANA (Meyr.). *Tortrix aulacana* Meyr., 1881, Proc. LINN. Soc. N.S.W., 6: 513 (Lectotype ♂ "Sydney, N.S. Wales, 28.9.78", hereby designated, Brit. Mus., genitalia slide No. BM3410). *Tortrix echinitis* Meyr., 1910, Proc. LINN. Soc. N.S.W., 35: 249 (Lectotype ♂ "Port Lincoln, S. Australia, 8.11.82", hereby designated, Brit. Mus., genitalia slide No. BM3401) (New synonymy).

EPIPHYAS PELOXYTHANA (Meyr.). *Tortrix peloxythana* Meyr., 1881, Proc. LINN. Soc. N.S.W., 6: 514 (Type locality: Murrurundi, N.S.W.; holotype ♂ Brit. Mus., genitalia slide No. BM3331).

EPIPHYAS IODES (Meyr.). *Epichorista iodes* Meyr., 1910, Proc. LINN. Soc. N.S.W., 35: 258 (Lectotype ♂ "Wallaroo, S. Australia, 2.11.82", hereby designated, Brit. Mus., genitalia slide No. BM3425).

EPIPHYAS LOXOTOMA (Turn.). *Tortrix loxotoma* Turn., 1927, *Pap. roy. Soc. Tasm.* (1926): 127 (Type locality: Mt. Wellington, Tas.; holotype ♂ C.S.I.R.O., genitalia slide No. T251).

EPIPHYAS EURAPHODES (Turn.). *Tortrix euraphodes* Turn., 1916, *Trans. roy. Soc. S. Aust.*, 40: 512 (Type locality: Mt. Kosciusko, N.S.W.; holotype ♂ C.S.I.R.O., genitalia slide No. T330).

EPIPHYAS AMMOTYPA (Turn.). *Tortrix ammotypa* Turn., 1945, *Trans. roy. Soc. S. Aust.*, 69: 64 (Type locality: Adelaide, S.A.; holotype ♂ C.S.I.R.O., genitalia slide No. T347).

EPIPHYAS EUGRAMMA (Low.). *Tortrix eugramma* Low., 1899, Proc. LINN. Soc. N.S.W., 24: 91 (Type locality: Brighton, V.; no specimen in the South Australian Museum is labelled as type, but one of two males labelled "Ocean Grange, 21.1.97, G4302" is hereby designated the lectotype).

EPIPHYAS POLIA (Turn.). *Cnephasia polia* Turn., 1945, *Trans. roy. Soc. S. Aust.*, 69: 70 (Type locality: Sydney, N.S.W.; holotype ♂ C.S.I.R.O., genitalia slide No. T946).

*Bactra eurysticha* Turn., 1946, *Trans. roy. Soc. S. Aust.*, 70: 212 (Type locality: Mittagong, N.S.W.; holotype ♂ C.S.I.R.O., genitalia slide No. T945) (New synonymy).

EPIPHYAS FLEBILIS (Turn.). *Tortrix flebilis* Turn., 1939, *Pap. roy. Soc. Tasm.* (1938): 78 (Type locality: Waratah, Tas.; holotype ♂ C.S.I.R.O., genitalia slide No. T690). *Tortrix leucocephala* Turn., 1945, *Trans. roy. Soc. S. Aust.*, 69: 63 (Type locality: Waratah, Tas.; holotype ♂ C.S.I.R.O., genitalia slide No. T691) (New synonymy).

EPIPHYAS HYPERACRIA (Turn.). *Epichorista hyperacria* Turn., 1916, *Trans. roy. Soc. S. Aust.*, 40: 515 (Type locality: Mt. Kosciusko, N.S.W.; holotype ♂ C.S.I.R.O., genitalia slide No. T791).

EPIPHYAS EUPHARA (Turn.). *Tortrix euphara* Turn., 1945, *Trans. roy. Soc. S. Aust.*, 69: 66 (Type locality: Milmerran, Q.; holotype ♀ C.S.I.R.O., genitalia slide No. T.689).

EPIPHYAS CERUSSATA (Meyr.). *Tortrix cerussata* Meyr., 1910, *Proc. LINN. Soc. N.S.W.*, 35: 234 (Type locality: Mt. St. Bernard, V.; holotype ♂ Nat. Mus. Victoria).

#### Acknowledgements.

Thanks are due to the authorities of the various institutions who have made material available for study, either on loan or during visits. The author is especially indebted to Mr. J. D. Bradley, British Museum (Natural History), to Mr. A. N. Burns and Mr. A. Neboiss, National Museum of Victoria, and to Mr. N. B. Tindale and Mr. G. F. Gross, South Australian Museum, Adelaide.

#### References.

- BRADLEY, J. D., 1956.—A new genus for *Tortrix postvittana* (Walker) and certain other Australian and New Zealand species (Lepidoptera: Tortricidae). *Bull. ent. Res.*, 47: 101-105.
- COMMON, I. F. B., 1958.—The genera of the Australian Tortricidae (Lepidoptera). *Proc. 10th Int. Ent. Congr.*, Montreal (1956), 1: 289-295.
- MEYRICK, E., 1913.—Lepidoptera Heterocera, Fam. Tortricidae. *Genera Insect.*, 149: 1-81.
- TURNER, A. J., 1927.—New and little-known Tasmanian Lepidoptera, Part II. *Pap. roy. Soc. Tasm.* (1926): 119-164.
- , 1939.—A second revision of the Lepidoptera of Tasmania. *Pap. roy. Soc. Tasm.* (1938): 57-115.